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ABSTRACT OF THE DISCLOSURE

[Processes of reductive decontamination using an agent containing at least two kinds of components, and then decomposing the agent using an apparatus for decomposing at least two kinds of chemical substances in the agent, are employed in chemical decontamination. A] In a chemical decontamination apparatus, a catalyst decomposition column in an upstream side of an ion exchange resin column and a hydrogen peroxide injection apparatus in a further upstream side, reduce the amount of waste products caused by a chemical decontaminating agent where a mixed decontaminating agent for a composition trapped in a cation resin column and for a composition trapped in an anion exchange resin are used for the chemical decontaminating agent, selectively decompose the composition trapped in the cation resin column in an inlet side of a cleaning apparatus when radioactive nuclides in the decontaminating agent are cleansed using the cation resin column during decontamination, and decompose both compositions after completion of the decontamination. The chemical decontamination thus selectively decomposes the chemical decontaminating agent, which is a component of the load to the cation resin column. [The chemical decontamination moderates corrosion of material by using a chemical decontaminating

